

ABSTRACTS OF PAPERS FOR THE WASHINGTON MEETING

The following abstracts were received too late for inclusion in the April Journal and are published here for reference purposes:

"The Fundamentals of Color Measurement"; D. L. MacAdam, *Kodak Research Laboratories, Rochester, N. Y.*

The modern science of color measurement had its origin in the researches of Helmholtz, Maxwell, and Grassmann in the years from 1852 to 1855. This science found no important practical application until the opening of the twentieth century when the (F.E.) Ives colorimeter was applied to the measurement and specification of the colors of practical illuminants. In 1922 the Optical Society of America, through its Committee on Colorimetry, recommended data and technics for color measurement which were immediately adopted throughout the world, replacing numerous unrelated, and often inconsistent, technics that had been developed to meet the insistent demands of various industries for color specifications. A set of data based upon the most recent researches was recommended by the International Commission on Illumination in 1931, and these more satisfactory data have in turn replaced the data and extended the unification of methods which originated with the O.S.A. Report of 1922.

Standard I.C.I. color specifications can be computed from spectrophotometric data. The fundamental relations that are used to define the quantities in terms of which colors are specified are most concisely expressed in mathematical formulas, which will be simply explained. As a matter of fact, short cuts based upon the standard I.C.I. 1931 data have been developed in the past few years so that no acquaintance with any mathematics other than ordinary arithmetic is now necessary for the performance of any of the essential operations encountered in standard color measurement. A typical example will be exhibited, and the interpretation of the results in terms of the dominant wavelength, purity, and brightness will be made clear by use of the chromaticity diagram. The conditions required in order that the colors of two samples shall match under some definite illuminant are that the three quantities in terms of which the colors are specified must be the same for the two samples.

"New Background Projector for Process Cinematography"; G. H. Worrall, *Mitchell Camera Corp., Hollywood, Calif.*

A new type of background projection apparatus has been developed for use in process work. This apparatus has been developed around the Mitchell sound movement or film-advancing mechanism used in the Mitchell sound type camera; so that the same type of mechanism that exposed the picture may now be used for projection in process work. The projector was developed with two things in mind, namely, freedom from maintenance due to heat spilled around the aperture, and reducing the noise as much as possible so as to eliminate booths.

"A Consideration of the Screen-Brightness Problem"; O. Reeb, *Osram, G.m.b.H.*, Berlin, Germany.

The great interest that the problem of optimal screen brightness holds in motion picture engineering is proved by the numerous researches on the subject in recent years. Besides the very interesting American papers published in this JOURNAL, some recent German works are worthy of consideration.

In 1936, K. F. Zimmermann published a paper entitled, "Technical Investigation of Picture Projection." He determined the dependence of the visual effect upon the screen brightness and found that a maximum value is attained at about 14 foot-lamberts. He investigated also the influence of light distribution, and the influence of a temporary brightness change. Finally he pointed out that the time that the eye needs to see all recognizable contrasts varies, according to the brightness level, between $\frac{1}{3}$ and $\frac{1}{10}$ second.

In 1936, J. Rieck published a paper that verified, under conditions similar to those in cinema theaters, the character of the contrast-sensibility relation that Brodhun and König had found in their classical research.

Very recently H. Frieser and W. Münch reported results obtained by projecting a detail test-object. They determined the contrast threshold function under conditions very similar to those of actual projection. They did not find a material increase in the number of distinguishable contrast steps for picture brightnesses exceeding 10 foot-lamberts.

It is to be hoped that the consideration of the results of all these investigations will form a basis for early temporary screen-brightness standardization.

"Wide-Screen Projection at the 1937 Paris International Exposition"; H. Griffin, *International Projector Corp.*, New York, N. Y.

The development of the "Hypergonar" lens in 1927 by Chretien, of the University and Optical Institute of Paris, introduced a device whereby the field of an objective may be doubled in one direction only. This lens was incorporated in the projection equipment used at the Palace of Light of the 1937 Paris International Exposition. The panoramic screen had an area of 600 square meters, and was 60 meters long and 10 meters high. It was built up with a mixture of lime and sand as a base, then covered with an insulating varnish, six layers of zinc white, and, finally, with an adhesive varnish upon which small spherical glass beads were sprayed with an air-gun. The screen was curved slightly and faced an outdoor auditorium, seating 4000 persons.

Two Simplex projectors fitted with special lenses and the Chretien device and each showing one-half of the picture were operated synchronously by a third projector placed between them. The third projector also carried a sound-film record. Each projector was equipped with a 250-amp. arc (70 volts) and a fixed-focus (120 mm.) $f/2$ objective. A special 110-volt 800-amp. generator was used.

The films were made with two cameras, each equipped with the special Chretien optical device and operated by a synchronous motor. One-half of the scene was photographed with each camera.

"Photographic Effects in the Feature Production 'Topper'"; R. W. Seawright and W. V. Draper, *Hal Roach Studios, Inc.*, Culver City, Calif.

An account is given of the various types of photography used in the feature production *Topper*. Among the shots discussed are a split screen against a projected background, demonstrating the feasibility of such treatment. Other effects are: Multiple exposures, animated split screen, animated travelling matts, straight animation, intricate matching of action, and a new process of subtractive matting.

A statement is included on the precautions taken to eliminate weave between the production shots taken with Mitchell cameras and the duping, which was done on Bell & Howell machines. The paper is illustrated with various selections from the picture, made by the processes described.